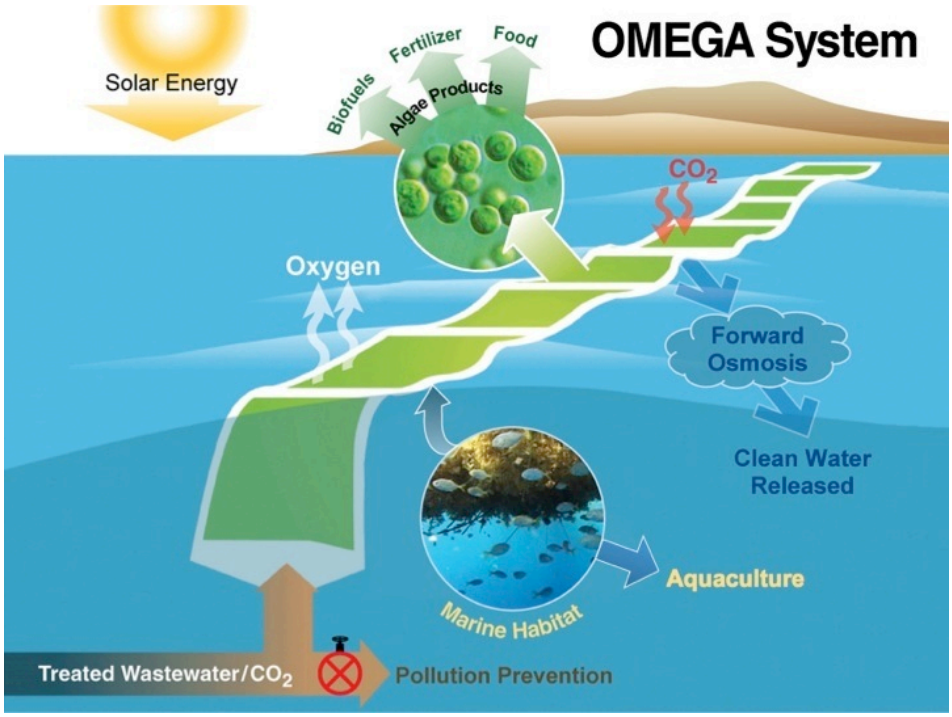
NASAfacts

OMEGA

Offshore Membrane Enclosures for Growing Algae



NASA's OMEGA system consists of large flexible plastic tubes, called photobioreactors. Floating in seawater, the photobioreactors contain freshwater algae growing in wastewater. These algae are among the fastest growing plants on Earth. The algae use energy from the sun, carbon dioxide and nutrients from the wastewater to produce biomass that can be converted into biofuels as well as other useful products such as fertilizer and animal food. The algae clean the wastewater by removing nutrients that otherwise would contribute to marine deadzone formation.

Mission Overview

Offshore Membrane Enclosures for Growing Algae (OMEGA) is an innovative method to grow algae, clean wastewater, capture carbon dioxide and ultimately produce biofuel. Using treated sewage as a growth medium, OMEGA would not compete with agriculture for water, fertilizer or land.

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The algae use energy from the sun, nutrients from wastewater and carbon dioxide to make oil-rich biomass that can be converted into biofuels. In addition to biofuels, the algae can produce fertilizer and a variety of other useful products.

The OMEGA system was investigated by NASA as a way to introduce an alternative way to produce aviation fuels. Potential implications of replacing fossil fuels include addressing the release of greenhouse gases, ocean acidification, and national security.

Science Objectives

NASA's project goals are to investigate the technical feasibility of a unique floating algae cultivation system and prepare the way for commercial applications.

Research by scientists and engineers has demonstrated that OMEGA is an effective way to grow microalgae and treat wastewater on a small scale.

The next step is for other organizations to deploy larger-scale systems offshore in protected bays to determine if OMEGA can be used commercially for biofuels production, environmental remediation, wastewater treatment or carbon sequestration.

NASA's Ames Research Center, Moffett Field, Calif, manages the OMEGA project.

For more information about OMEGA, visit:

http://www.nasa.gov/omega

For more information about Ames, visit:

http://www.nasa.gov/ames

Wastewater with oil-producing algae circulate through photobioreactors (green tubes) floating in a seawater tank at the San Francisco Southeast Wastewater Treatment Plant, where NASA has set up one of its OMEGA research facilities.

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